

NOTES.

THE prevalence and treatment of insanity have been the subject of much consideration recently; but it appears from a letter by Prof. Clifford Allbutt in Wednesday's *Times* that though our system of public asylums is honourable and humane in intention, it is, in a scientific sense, a gigantic muddle. In fact, our management of insanity is, scientifically, a chaos. "Muddle! In England, and in England alone, we muddle with complacency. Now to muddle is to labour with effects without regard to causes. Thus it is that we strive with the 'unemployed'; thus that we strive with commercial incapacity; thus that we strive with educational failures, and so forth; 'compromise' being with us not the word for adaptations, but for supineness. . . . We pile up hospitals, sanatoriums, sick asylums, homes for incurables, colonies for epileptics and idiots, at vast cost direct and indirect, and wealthy persons make bequests, sometimes even liberal bequests, to such purposes; but what testator leaves money to an organisation of research by physicians and pathologists into the sources from which this frightful and manifold destruction pours forth with an absolutely, and perhaps with a relatively, augmenting volume? (I must not seem to forget the Lister Institute or recent gifts to the Cancer Fund; but of the general truth of my statement your own reports of bequests from day to day are sufficient testimony.) No wonder that, thus ignorant but beginning to 'wake up,' we run to the nearest plausible short cuts—to quackery and to hand-to-mouth remedies which are no remedies—rather than to the laborious investigation of origins and accelerations. If fifty years ago a tithe of the money expended upon the charities which are fighting at heavy odds with consequences had been spent upon knowledge, and this knowledge had been applied to prevention by a Ministry of Health instead of, as in its present imperfection, by a secondary department of some other office, by this time half of our expenditure on these melancholy results of our ignorance would have been saved, and the saving would be rapidly multiplying itself." Prof. Allbutt urges that hospitals should be established for research into diseases of the nervous system, certain wards or wings being provided for the insane. The staff of a hospital of this kind should consist of young physicians, intellectually mature and highly and variously trained. Only when continuous and critical observations have been made under scientific conditions will it be possible to begin to create a classification of diseases of the nervous system by pathological affinity to displace the classifications which now are admirable only or chiefly for logical and meta-physical ingenuity.

DR. N. L. BRITTON, director of the New York Botanical Garden, has been elected president of the New York Academy of Sciences.

A PAPER by the Duke of the Abruzzi upon his expedition to Mount Ruwenzori will be read at a special meeting of the Royal Geographical Society on Saturday, January 12.

MR. SYDNEY S. HOUGH, F.R.S., chief assistant in the Royal Observatory, Cape of Good Hope, has been appointed His Majesty's astronomer at that observatory on the retirement of Sir David Gill, K.C.B., F.R.S.

THE honorary treasurer of the Imperial Cancer Research Fund has received from Mr. and Mrs. Bischoffsheim the munificent donation of 40,000*l.* on the occasion of the celebration of their golden wedding.

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At the annual banquet of the Institute of Chemistry of France a few days ago, it was announced in the name of the Minister of Public Instruction that the French Government has drawn up a decree giving academic recognition to the profession of chemical engineer.

THE *Kew Bulletin* announces that Captain A. T. Gage has been appointed superintendent of the Royal Botanic Gardens, Calcutta, and director of the Botanical Survey of India. We learn from the same source that Dr. D. H. Scott, F.R.S., has relinquished his post of honorary director of the Jodrell Laboratory, Kew, which he has filled with great distinction during the past fourteen years.

A MOVEMENT has been inaugurated by the professors of the National Museum of Natural History in Paris, with the approval of the Minister of Public Instruction, for the erection of a statue of Lamarck in the Jardin des Plantes. Subscriptions to the fund which is being raised may be sent to M. Joubin, secretary to the committee, 55 rue de Buffon, Paris.

THE Aëro Club has arranged for an exhibition in connection with the International Motor-car Exhibition to be held at the Royal Agricultural Hall, London, from April 6-13 next. Prizes to the value of 250*l.* are offered by the proprietors of the *Daily Mail* for model flying machines, and full particulars as to the conditions of the competition may be obtained from Mr. Harold E. Perrin, Aëro Club, 166 Piccadilly, London, W.

It is stated in *Engineering* of December 28, 1906, that the German Railway Union has presented to the Science Museum at Munich an exact reproduction of "Puffing Billy," the oldest locomotive in existence, now preserved in the Victoria and Albert Museum. The Munich engine is an exact counterpart of the original, and has been tested under steam, when a train load of 38½ tons was hauled at upwards of six miles per hour. The work was carried out at the central shops of the Royal Bavarian State Railways at Munich.

WE learn from *Science* that Prof. H. F. Osborn has declined the secretaryship of the Smithsonian Institution, to which he was elected by the regents on December 4, 1906. In a letter to the Chancellor of the institution, Prof. Osborn explains why he is unable to accept the post of secretary. Chief among these reasons is the fact that he is nearing the completion of several monographs and books, the prosecution of which is dependent upon the collections which he has brought together in New York and the staff of trained assistants who are working with him.

A SPECIAL report from Berlin in the *Pall Mall Gazette* of December 28, 1906, described some wireless telephony experiments which have been made by Prof. Slaby, who claims to have solved successfully the problem of wireless telephony, which has been so often attempted. The trials took place over a distance of forty kilometres between the headquarters of the Wireless Telegraph Co. in Berlin and the wireless station at Nauen. The microphone was connected to a wire rising about six metres above the roof, and both figures and a sentence of extreme phonetic difficulty were received and repeated back without error, and very clearly heard. Prof. Slaby claims that no approach to forty kilometres has ever been tried before, and that his success is due to the isolation of the microphones and the "damping" of all foreign vibrations. We do not know the greatest distance over which Mr. Paulsen has successfully conducted his wireless telephony, and we shall wait with interest to see what developments may

take place very shortly, as some marked advance may surely be expected when the results of the experiments of two such investigators as Prof. Slaby and Mr. Paulsen become fully known.

THE recent experience of the London County Council tramways under Arctic conditions has not strengthened the arguments of those sections of the public and engineers who are all for the abolition of the overhead system in favour of the underground conduit system. Granted that the conditions which caused the serious interruption of traffic last week are not usual and were not expected, it is still hard to account for the unpreparedness of those in charge of the London County Council tramways. In happy contrast to this comes the news of the capabilities of the overhead system in Liverpool, where not only was the service maintained without mishap, but the trams were of great assistance in clearing away the snow by drawing trollies of salt over the city, thus enabling the salt to be distributed rapidly, and making it easy work for the firemen to wash down the streets afterwards. Wolverhampton also suffered by not having an overhead system of tramways, and the service had to be discontinued. We have not yet heard of any case where an overhead system of tramways in England has failed owing to the recent snow, so that, at a time when the telegraph wires are being broken down by snow and by the force of the gales we have been experiencing lately, it speaks well for modern overhead tramway practice that it should have passed through the ordeal so successfully, and once again helps to prove that the supposed dangers and disadvantages of the overhead system are more fancied than real.

A CORRESPONDENT, writing from Torbay, states that on December 29, 1906 (full moon), and more particularly on December 30, from 10 p.m. to 11.30 p.m., she observed a remarkable lunar halo. The moon appeared in the centre of a pellucid patch of sky enclosed by the halo, which measured at least four times the moon's apparent diameter, and in this clear sky, as in a mirror, our correspondent saw a reflection of the moon.

WE learn from the *Pioneer Mail* that the Dooars' Planters' Association recently discussed the subject of malaria and black-water fever. The meeting viewed with great concern the alarming prevalence of malaria and black-water fever in the western Dooars, and was of opinion that all possible steps should be taken to inquire into these diseases with a view to check them. The association is convinced that the report of the commission on malaria to the Royal Society, dated 1902, goes to the root of the evil, and that the *Anopheles* mosquito, which is found in large numbers in the Dooars, is the cause of the prevalence of malaria and black-water fever, and that no time should be lost before tackling the question scientifically. As a preliminary, the Indian Tea Association of Calcutta and London is to be asked to move in the matter, and the association will also address the local Government and the Government of India on the subject, and the Home Government through the Tea Association.

THE most important item in the November (1906) issue of the *Victorian Naturalist* is a paper by Prof. Baldwin Spencer on emu remains from King Island, Bass Strait. Definite information as to the former existence of an emu on this island is to hand, and, since the bones recently discovered indicate a bird of smaller size than *Dromaeus ater* of Kangaroo Island, the name *D. minor* is proposed for the new species.

WE have to acknowledge the receipt of a copy of part ii. (vol. i.) of the new journal *Experimentelle Beiträge zur Morphologie*, published at Leipzig, and edited by Mr. Hermann Braus, of Heidelberg. In the first article Mr. O. Bender describes a case of "hypermelism" in an edible frog, in which the abnormality takes the form of an additional hind-limb, and discusses the morphological conclusions to be drawn therefrom. The second article, by the editor, is devoted to the mode of development of the fore-limb and operculum in the larva of the fire-bellied toad (*Bombinator*).

"SOME Problems of the Sea" forms the title of the presidential address delivered by Prof. Herdman to the meeting of the Liverpool Biological Society held on October 26, 1906. After alluding to the frequent periodical local variation in the constituents of the plankton and the endeavours which have been made to ascertain the actual or relative numbers of organisms inhabiting a given area in the sea, the president proceeded to institute a comparison between the littoral fauna of Ceylon and that of the Maldive Archipelago. In explanation of certain differences of these two faunas, it is suggested that it may be easier for a shallow-water, non-pelagic species to reach Australia from India by way of Malaysia rather than cross the open sea separating Ceylon from the Maldives.

THE first part of the sixth volume of *Annotationes Zoologicae Japonensis* opens with an account of a new Japanese salpeid, provisionally referred to the genus *Cyclosalpa*, by Mr. W. E. Ritter. Although only a single specimen, taken in Suraga Bay, is forthcoming, this is amply sufficient to demonstrate the marked distinctness of the new form. Until examples of the aggregate generation are available, the full affinities of the species cannot be determined. Its most obvious features are the straight intestine, the great number of the muscle-bands, which exceed those of all other forms except one *Salpa*, and the fact that many of these bands extend right round the body. In the latter respect the new form tends to minimise the differences separating the *Doliolidæ* from the *Salpidæ*. The other papers in the same issue deal respectively with Japanese butterflies, cockroaches, and ascidians.

SINCE very little is known in regard to the segmentation of the ovum among mammals, workers in embryology should welcome a paper by Mr. M. Kunsemüller in the *Zeitschrift für wissenschaftliche Zoologie*, vol. lxxxv., part i., on this stage of development in the hedgehog. Comparisons are made between the segmentation in this species and other mammals in which it has been observed. A second article in the same issue deals with the early stages in the development of the grass-snake, from the first appearance of the pro-amnion to the close of the amniotic stage. The paper ends with a *résumé* of the present state of our knowledge of snake-development, which is still very imperfect. Regeneration in polychæte worms forms the subject of the third article, by Mr. P. Ivanoff, of St. Petersburg. Apparently the article was written previous to the issue of Nusbaum's paper on regeneration in *Nereis* in vol. lxxix. of the same journal, but its publication was delayed by the necessity of translation. Some of the author's conclusions have thus been anticipated. Among other curious examples of regeneration, Mr. Ivanoff mentions one case in which an annelid developed a complete functional head at each extremity of the body. In the fourth article Mr. F. Vejdovsky resumes his discussion of the hæmacœle theory, as illustrated by the vascular system of worms.

WITH regard to the naming of plants of *Lessonia* received from the Antarctic region, Mr. and Mrs. A. Gepp note in the *Journal of Botany* (December, 1906) that anatomical investigation discloses a distinction between the specimens from Cape Adare and Coulman Island and that from the South Orkneys. The former receives the name of *Lessonia grandifolia*, the latter *L. simulans*.

IN vol. xvi. of the Transactions of the South African Philosophical Society is a paper by Mr. L. Péringuey on petroglyphs of animals and men in South Africa considered in relation to those found in northern Africa. He points out that two kinds of workmanship are found in Algeria and the Sudan—line engraving and dot engraving, the former being apparently much older, as prehistoric animals now extinct, such as *Bubalus antiquus*, are represented with great fidelity. Similar differences of technique exist in South Africa, and the author argues that they afford evidence of a pre-Bushman race akin to the aborigines of the north; but he is evidently a zoologist, not an anthropologist, and it is clear that more material is needed for comparison, as well as definite archæological data, before the views set forth in this paper can rank as



Rock engraving (chalked to show clearly) of a Gemsbok checking itself while at full speed.

more than mere conjectures. The article is well illustrated by ten figures, of which one is reproduced here; the author remarks that it represents a gemsbok checking itself at full speed before an object intended to alarm it, but it does not seem necessary to assume more than a chance connection between the figures. The petroglyphs were chalked over for photographic purposes; this introduces an element of uncertainty which it would be well to eliminate.

ON the subject of diseases of palms, Mr. E. J. Butler contributes a paper to the *Agricultural Journal of India* (vol. i., part iv.) recording three diseases that have come under his observation in India. In the first case the inflorescences of betel-nut palms were destroyed by a *Phytophthora* causing what is locally known as "kale roga" or black rot; in another a bud-rot disease of palmyra and cocoa-nut palms in the Godavari district was traced to a *Pythium*. The so-called betel-nut plague occurring in Sylhet was more difficult to diagnose, but the author refers it definitely to a fungus attacking the roots, and the clamp-connections in the mycelium point to its being a basidiomycete. Detailed descriptions are given and remedial measures suggested.

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THE latest addition to the series of German pamphlets on the pedagogics of the natural sciences published by P. G. Teubner, of Leipzig, deals with the subject of a scheme for teaching nature-study in schools. The author, Dr. P. Henkler, reviews several schemes advocated by masters of pedagogy and instructors in natural history before elaborating his own syllabus. During the first stage, for small children, extending over three courses, it is suggested that interest in natural objects should be aroused by imaginative or personified presentment, and observation be coordinated with facts of everyday life. In the second stage, botany and zoology would be taught as independent subjects, the essential idea being to stimulate the faculty of inquiry by studying purpose and cause.

MR. MALCOLM BURR has written, for the Kent Coal Concessions, Ltd., a popular introduction to the study of the geology of the south-eastern coalfield. It contains in simple language a concise explanation of the principles of geology sufficient to enable shareholders to follow intelligently the significance of the various borings carried out under the auspices of the company.

IN the *Engineering Magazine* (vol. xxxii., No. 3) there is an admirably illustrated article by Mr. Frank L. Hess on the York tin region of Alaska, where lode tin was discovered in 1903. Should the lode deposits be shown to contain sufficient tin to pay for working, they will have many advantages over placer deposits, inasmuch as mining would not have to be confined to the short open season.

THE Transactions of the Institution of Engineers and Shipbuilders in Scotland (vol. 1., part ii.) contains an interesting paper by Mr. Hugh Campbell on suction gas engines. The introduction of the suction gas plant, invented in 1894, is causing a greater revolution in practice than has occurred in connection with the development of large gas engines, which are mainly used at the present time in conjunction with blast-furnace gas. Its very high economy, extreme simplicity, its cleanliness, and the small amount of space it occupies are sufficient to commend it to power users.

A PAPER read by Mr. Henry Fowler before the Institution of Mechanical Engineers on December 14, 1906, dealing with the lighting of railway premises, contained much information of value to engineers generally. The lighting on a railway is chiefly provided by means of oil, gas, or electricity, gas being probably the most general illuminant. In most places it has been able to hold its position owing to the introduction of incandescent mantles. The cost of maintaining an incandescent mantle for a year to June, 1906, is shown to have been as follows:—mantles 5.20d., chimneys 1.27d., forks 0.33d., and wages 1s. 4.16d. per annum.

IN a recent note (p. 181) attention was directed to the recent renewal of experiments with Count Zeppelin's latest airship on the Lake of Constance. An account of these new experiments is given by Dr. Wilhelm Krebs in *Das Weltall* for December 15, 1906. The 1906 Zeppelin airship, like its forerunners, consists of eighteen separate compartments or separate balloons supported on a rigid cylindrical aluminium framework, the whole being encased in a covering of balloon silk. The rigidity being secured by the framework, the use of an internal "ballonet" is dispensed with. The whole airship is 128 metres long by 11 metres high, and each of the two cars can hold four persons, besides having a separate motor. The author states that with both motors working simultaneously a

speed of 15 metres per second, or 54 kilometres per hour, can be maintained for sixty hours with the quantity of benzene the machine will carry. With one motor alone working a speed of 11 metres per second would be maintained for 120 hours. The advantages of the Zeppelin airship are more or less counterbalanced by the present necessity of using a sheet of water for starting and landing. Apart from the uses of such a machine in warfare, its applications in time of peace to the meteorological survey of the atmosphere are contemplated.

An interesting but highly mathematical memoir by Prof. Karl Pearson and Mr. J. Blakeman on "A Mathematical Theory of Random Migration" has just been issued by Messrs. Dulau and Co. (Drapers' Co. research memoirs, biometric series, iii.). The problem dealt with is, in simple terms, the following:—given that a large number of individuals move by successive straight steps of length l in random directions, starting from one and the same point, required to find their distribution after n such steps. The solution, which is obtained in terms of Bessel functions, is applicable to such practical problems as the infiltration of mosquitoes into a cleared area, or the recovery of a habitat by a species which has been driven out owing to temporarily unfavourable conditions. Prof. Pearson obtained some assistance in the solution of the problem through a letter addressed to our correspondence columns (vol. lxxii., p. 294, July 27, 1905); Lord Rayleigh directed his attention (*ibid.*, p. 318) to the fact that when the number of steps n is very large, the problem becomes identical with a problem in sound; and Prof. Kluver presented a memoir on the subject to the Royal Academy of Sciences of Amsterdam (Proceedings, October 25, 1905). Reference should, we think, have been made, in the introduction to the memoir, to the address delivered by Major Ross "On the Logical Basis of the Sanitary Policy of Mosquito Reduction" at the St. Louis Congress of 1904 (*British Medical Journal*, May 13, 1905). This contains the first published discussion of the problem, with especial reference to its most important practical application, and suggests a simple approximate solution in terms of the binomial series.

An investigation of the temperatures obtainable by the use of solid carbon dioxide under different pressures forms the subject of a paper by Messrs. John Zeleny and Anthony Zeleny in the *Physical Review* (vol. xxiii., No. 4). In a deep vessel of such a shape that the material is surrounded by its own vapour, the same temperature is given under any one pressure by the carbon dioxide either alone or when mixed with alcohol or ether; it is, however, more easy to maintain the temperature constant when the solid is moistened with ether. A table is given showing the temperatures obtainable by varying the pressure above the solid from 2 cm. to 84 cm. of mercury. At the former pressure the temperature is $-116^{\circ}7$, and at the latter -77° C.

SOME very remarkable results have been obtained by Prof. R. W. Wood in the course of an investigation of the fluorescence and magnetic rotation spectra of sodium vapour, published in the Proceedings of the American Academy of Arts and Sciences (vol. xlii., No. 13), and also in the *Physikalische Zeitschrift* (No. 24). The fluorescence spectra were observed using monochromatic light of a definite wave-length as source of excitation. Different series of lines are seen with different exciting wave-lengths. The series are mostly of a very simple character, consisting of groups of lines separated by a constant wave-length. The same series of lines are also observed in the magnetic

rotation spectrum of sodium vapour, which can thus be subjected to analysis. Certain lines, however, which occur singly in the magnetic spectrum occur as doublets in the fluorescence spectra. The detailed measurements obtained, from the comparative simplicity of the phenomena, are likely to prove of very great importance in discussing the mechanism of molecular vibration and radiation.

FROM the dissociation theory of solution it might be inferred that as the radiation from a radio-active substance renders a gas conducting by causing ionisation of the gaseous particles, an increase of the conductivity of aqueous solutions should follow from their exposure to radio-active influence. The effect in the latter case should, indeed, be very marked, inasmuch as partial ionisation of a salt occurs merely on dissolving it in water, whereas in the case of a gas ionisation takes place only under special influences. The conductivity of a large number of salts in aqueous solution has been measured by M. S. M. Sabat (Bulletin of the Cracow Academy of Sciences, 1906, No. 1) during their exposure to the radiation produced by 0.2 gram of Prof. Curie's most active preparation of radium bromide. After making allowance for the alteration of resistance caused by the rise of temperature due to the radiation, the conclusion is drawn that not the slightest change in conductivity can be attributed to a change in the degree of ionisation of the salt within the solution. If such a change of ionisation takes place it is so slight as to be altogether negligible.

MR. DAVID NUTT has published for the Folk-lore Society a "Bibliography of Folk-lore" for 1905, which has been compiled by Mr. N. W. Thomas. The price of the booklet is 1s. net.

MESSRS. J. AND A. CHURCHILL have published a third edition of "A Handbook of Physics and Chemistry adapted to the Requirements of the First Examination of the Conjoint Examining Board of the Royal Colleges of Physicians and Surgeons and also for General Use," by Messrs. Herbert E. Corbin and Archibald M. Stewart.

WE have received a copy of the report of the Meteorological Service of Canada for the year ended on December 31, 1904. In nearly four hundred foolscap pages Mr. R. F. Stupart, the director, has brought together results of observations of the temperature, pressure, rainfall, snowfall, amount of bright sunshine, and other meteorological data concerning all parts of Canada. The volume also includes the magnetic results for each month and for the year 1904.

IN his work "Erkenntniss und Irrthum," reviewed in NATURE of November 30, 1905 (vol. lxxiii., Supp., p. vii), Prof. E. Mach partly included three essays in which the questions of the nature, origin, and development of our concepts of space were discussed from several points of view. The English rendering of these essays, which originally appeared in the *Monist*, has now been published in volume form by Messrs. Kegan Paul and Co., Ltd., under the title "Space and Geometry in the Light of Physiological, Psychological, and Physical Inquiry."

IN NATURE of October 11, 1906 (vol. lxxiv., p. 594), reference was made to a paper by Prof. Kamerlingh Onnes and Dr. Heuse on the expansion of glass at very low temperatures, and attention was directed to the work of Dr. Travers on the same subject. Prof. Onnes writes to point out that the memoir referred to was a translation of a Dutch paper, published somewhat earlier than that of Dr. Travers, to which we alluded, and that in a more recent communication on the same subject he has not failed to recognise the results obtained by this investigator.